

REMARKS

[0003] Applicant respectfully requests reconsideration and allowance of all of the claims of the application. Claims 1, 4-9, 12-22, 24, 26-28, and 35-42 are presently pending. Claims 8, 13-16, 18-19, 24, 35, 38-39, and 41-42 are amended. No claims are canceled and no claims are added.

Statement of Substance of Interview

[0004] Examiner Carl Colin graciously talked with Trevor Lind—the undersigned representative for the Applicant—on May 8, 2008. Applicant greatly appreciates the Examiner’s willingness to talk. Such willingness is invaluable to the common goal of an expedited prosecution of this patent application.

[0005] During the interview, differences between the claims and the cited references, namely U.S. Patent No. 6,614,914 (“Rhoads ’914”), were discussed. Without conceding the propriety of the rejections and in the interest of expediting prosecution, possible clarifying amendments were proposed.

[0006] The Examiner appeared receptive to the proposals, specifically the clarification regarding encoding the binary bit of a covert message in each frame of the subject bitframe at a different frequency with respect to each frame and the clarification regarding permuting values associated with each of the plurality of bitframes of a digital audio signal such that the values associated with the respective bitframes are arranged in a different order than the plurality of bitframes. However, the Examiner indicated that he would need to review the cited art more carefully and/or do another search, and requested that the proposed amendments be presented in writing.

[0007] Applicant presents arguments and amends the claims based on the discussion that occurred during the interview. Accordingly, Applicant submits that the pending claims are allowable over the cited art of record for at least the reasons discussed during the interview.

Formal Request for an Interview

[0008] If the Examiner's reply to this communication is anything other than allowance of all pending claims, then I formally request an interview with the Examiner. I encourage the Examiner to call me—the undersigned representative for the Applicant—so that we can talk about this matter so as to resolve any outstanding issues quickly and efficiently over the phone.

[0009] Please contact me to schedule a date and time for a telephone interview that is most convenient for both of us. While email works great for me, I welcome your call as well. My contact information may be found on the last page of this response.

Claim Amendments and Additions

[0010] Without conceding the propriety of the rejections and in the interest of expediting prosecution, Applicant amends claims 8, 13-16, 18-19, 24, 35, 38-39, and 41. Applicant amends at least some of the claims to clarify claimed features and these amendments should not be construed as further limiting the claimed invention in response to the cited references. Such amendments are made to expedite prosecution and more quickly identify allowable subject matter. Support for the amendments to claims 14, 35, 39, and 42 is found in the specification at least at page 26, lines 16-17; page 30, line 4 – page 31, line 6; and page 25, lines 5-8, respectively.

SUBSTANTIVE MATTERS

Obviousness Rejections

Lack of Prima Facie Case of Obviousness (MPEP §2142)

[0011] The arguments presented below point to various aspects of the record to demonstrate that all of the criteria set forth for making a *prima facie* case of obviousness with respect to claims 1, 4-9, 12-22, 24, 26-28, and 35-42 have not been met. For example, Applicant respectfully submits that Rhoads '914 is not prior art with respect to claims 1, 4-9, 12-22, 24, 26-28, and 35-42. In particular, the present Application has a priority date based on a provisional patent application dated July 13, 1999. Rhoads '914 was filed on February 14, 2000, and is a continuation in part of U.S. Patent No. 7,171,016 filed November 5, 1998. However, Applicant respectfully submits that at least some of the cited portions of Rhoads '914 are not supported by U.S. Patent No. 7,171,016. In one illustration, Applicant submits that the spread spectrum modulation technique utilizing a XOR operation described in col. 16, ll. 45-64 of Rhoads '914 and cited on pg 5, ll. 5-9 of the Action to reject a portion of at least claims 1, 4, 8, 18, 20, 22, 24, 26, 36-37, and 42 is not supported by U.S. Patent No. 7,171,106. Therefore, Applicant respectfully submits that at least this portion of Rhoads '914 is not prior art with respect to the Application because the priority date of this portion of Rhoads '914 would be the filing date of Rhoads '914 (February 14, 2000) and not the filing date of the parent application and the filing date of Rhoads '914 is after the priority date of the Application (July 13, 1999). Additionally, even if Rhoads '914 is prior art with respect to claims 1, 4-9, 12-22, 24, 26-28, and 35-42, Applicant respectfully

submits that all of the criteria set forth for making a *prima facie* case of obviousness have not been met because Rhoads '914 does not teach or suggest all of the features of claims 1, 4-9, 12-22, 24, 26-28, and 35-42.

Based upon Rhoads '914 and Yoshida

[0012] The Action rejects claims 1, 4-9, 12-15, 18-22, 24, 26-28, and 35-41 under 35 U.S.C. §103(a) as being unpatentable over Rhoads '914 in view of U.S. Patent No. 6,449,378 ("Yoshida"). Applicant respectfully traverses the rejections of these claims and asks the Examiner to withdraw the rejections of these claims.

Independent Claim 1

[0013] Applicant submits that the cited portions of Rhoads '914 and the cited portions of Yoshida do not teach or suggest at least the following elements of claim 1:

- "receiving a first data pattern of discrete values which are bits of a watermark and a second data pattern of discrete values which are bits of a covert message"
- "imposing a discrete value of the second data pattern over one or more discrete values of the first data pattern to generate a third data pattern, wherein the imposing is carried out by performing a

Boolean operation with a discrete value of the second data pattern and multiple discrete values of the first data pattern”

- “encoding the third data pattern into the digital signal, wherein a different bit of the watermark is encoded in each frame of at least one subject bitframe, and wherein a same bit of the covert message is encoded in each frame of the subject bitframe”

[0014] With respect to the features of claim 1 mentioned above, pages 4-6 of the Action state:

“As per claims 1, 7, 35-36, and 40-41, Rhoads et al discloses a method for concealing data within a digital signal, the method comprising: **Rhoads et al** discloses receiving a first data pattern of discrete values which are bits of a watermark and a second data pattern of discrete values which are bits of a carrier or raw bit or control parameter depending on the embodiment that meets the recitation of covert message (see column 6, line 50 through column 7, line 40 and column 9, line 35 through column 10, line 22); imposing a discrete value of the second data pattern over one or more discrete values of the first data pattern to generate a third data pattern (watermarked signal) and encoding a third data pattern into the digital signal (column 7, line 17 through column 8, line 30; column 9, line 60 through column 10, line 18 and column 11, lines 7-32). See also column 3, lines 4-20 and figures 1 and 2. **Rhoads et al** suggests using any non-linear function and further discloses using a spread spectrum modulation wherein the imposing is carried out by performing a Boolean

operation with a discrete value of the second data pattern and discrete value of the second data pattern and multiple discrete and multiple discrete values of the first data pattern (see column 16, line 45 through column 17, line 10)...**Rhoads et al** also suggests replicating a watermark in each block (column 9, line 60 through column 10, line 18) and using one watermark per frame (column 20, lines 1-67) that meets the recitation of wherein a different bit of the watermark is encoded in each frame of a set of frames and the different bit is repeated in each block, each raw bit (covert message) may be spread into a number of chips or defining a pattern of watermark samples which implies that since a watermark can occupy a number of frames, the same raw bit can be replicated in a number of frames that meets the recitation of a same bit of the covert message is encoded in each frame of a set of frames (column 9, line 60 through column 11. See also another embodiment disclosed by Rhoads (column 27, lines 44-67) and Digimarc's Watermarking Technology (column 37, line 35 through column 38)." (underlining added)

[0015] Pages 4 and 5 of the Action appear to characterize the first data pattern of discrete values as bits of a watermark and to characterize the second data pattern of discrete values relating to the covert message as the raw bits or the carrier signal of Rhoads '914. (See the underlined sections of pages 4 and 5 of the Action above). However, Applicant respectfully submits that the watermark signal of Rhoads '914 is not combined with the raw bits or carrier bits, but derived from them. In particular, the cited portions of Rhoads '914 teach an error correction coding function that receives control bits and bits of a message

to produce raw bits and that the message is a binary number suitable for conversion to a watermark signal. (*See* Rhoads '914, col. 9, ll. 37-39). In addition, the cited portions of Rhoads '914 teach embedding raw bits derived from the message into a watermark information signal by using an assignment map to determine an image sample or samples to be modified to encode a particular raw bit and to determine the corresponding image sample(s) in the carrier signal. (*See* Rhoads '914, col. 9, l. 62 – col. 10, l. 13). Further, the cited portions of Rhoads '914 disclose that for each raw bit, an embedder computes the value of the image samples in a watermark information signal as a function of the particular raw bit value and the value(s) of the corresponding samples in the carrier signal. (*See* Rhoads '914, col. 10, ll. 13-17). Rhoads '914 also teaches that the watermark information signal is combined with a perceptual mask to yield a watermark signal and that the watermark signal is combined with an input image to produce a watermarked image. (*See* Rhoads '914, col. 12, ll. 25-29). Thus, the cited portions of Rhoads '914 do not teach or suggest imposing a discrete value of a second data pattern, which are bits of a covert message, over one or more discrete values of a first data pattern, which are bits of a watermark, to generate, a third data pattern and encoding the third data pattern into a digital signal, where a different bit of the watermark is encoded in each frame of at least one subject bitframe, and where a same bit of the covert message is encoded in each frame of the subject bitframe, as in claim 1. Rather, the cited portions of Rhoads '914 teach combining a watermark signal with an input image to produce a watermarked image.

[0016] Additionally, the cited portions of Rhoads '914 do not teach or suggest imposing a discrete value of the second data pattern over one or more discrete values of the first data pattern to generate a third data pattern by performing a Boolean operation with a discrete value of the second data pattern and multiple discrete values of the first data pattern, as recited in claim 1. In contrast to claim 1, the cited portions of Rhoads '914 teach a spread spectrum modulation technique that performs an exclusive OR (XOR) operation between a raw bit and each bit of a pseudo random binary number acting as a carrier signal. (*See Rhoads '914*, col. 16, ll. 48-53). The cited portions of Rhoads '914 do not teach or suggest generating a third data pattern by performing a Boolean operation with a discrete value of the second data pattern (a bit of the covert message) and multiple discrete values of the first data pattern (bits of the watermark), as recited in claim 1. Rather, the cited portions of Rhoads '914 teach performing an XOR operation between a raw bit and a pseudo random number as part of the process of creating a watermark signal. (*See Rhoads*, col. 16, ll. 45-46).

[0017] Further, in contrast to claim 1, the cited portions of Yoshida teach sequentially embedding bits constituting watermark information one by one into each frame related to a moving image and embedding 1-bit watermark information into a block of an input image. (*See Yoshida*, col. 2, l. 65 – col. 3, l. 7 and col. 9, ll. 30-62). The cited portions of Yoshida do not teach or suggest imposing a discrete value of a second data pattern, which are bits of a covert message, over one or more discrete values of a first data pattern, which are bits of a watermark, to generate, a third data pattern and encoding the third data

pattern into a digital signal, where a different bit of the watermark is encoded in each frame of at least one subject bitframe, and where a same bit of the covert message is encoded in each frame of the subject bitframe, as in claim 1. In addition, the cited portions of Yoshida do not teach or suggest imposing a discrete value of the second data pattern over one or more discrete values of the first data pattern to generate a third data pattern by performing a Boolean operation with a discrete value of the second data pattern and multiple discrete values of the first data pattern, as recited in claim 1.

[0018] Accordingly, claim 1 is allowable because the cited art does not teach or suggest each feature of independent claim 1 and Applicant asks the Examiner to withdraw the rejection of this claim.

Dependent Claims 4-8

[0019] Dependent claims 4-8 ultimately depend upon independent claim 1. As explained previously, the cited portions of Rhoads '914 and the cited portions of Yoshida do not teach or suggest all of the features of claim 1. Thus, the cited art does not teach or suggest all of the features of claims 4-8. Accordingly, at least for these reasons, claims 4-8 are allowable at least by virtue of their dependency from claim 1 and Applicant asks the Examiner to withdraw the rejections of these claims.

Independent Claim 9

[0020] Applicant submits that the cited portions of Rhoads '914 and the cited portions of Yoshida do not teach or suggest at least the following features of claim 9:

- “receiving a digital signal, the digital signal being segmented into a series of bitframes which each include a set of frames, the digital signal having an encoded data pattern of discrete values representing a first data pattern of discrete values which are bits of a watermark, a different bit of the watermark encoded in each frame of at least one subject bitframe, and a covert data pattern of discrete values which are bits of a covert message, a same bit of the covert message encoded in each frame of the subject bitframe”

[0021] With respect to claim 9, page 7 of the Action states:

“Claims 9, 13, 19, and 21 recite similar limitations as found in claim 1 and therefore is (sic) rejected on the same rationale as in the rejection of claim 1.”

[0022] As explained previously, the cited portions of Rhoads '914 and the cited portions of Yoshida do not teach or suggest a digital signal being segmented into a series of bitframes which each include a set of frames, the digital signal having an encoded data pattern of discrete values representing a first data pattern of discrete values which are bits of a watermark, a different bit

of the watermark encoded in each frame of at least one subject bitframe, and a covert data pattern of discrete values which are bits of a covert message, a same bit of the covert message encoded in each frame of the subject bitframe, as recited in claim 9. Accordingly, claim 9 is allowable because the cited art does not teach or suggest each feature of independent claim 9 and Applicant asks the Examiner to withdraw the rejection of this claim.

Dependent Claims 12-13

[0023] Dependent claims 12-13 ultimately depend upon independent claim 9. As explained previously, the cited portions of Rhoads '914 and the cited portions of Yoshida do not teach or suggest all of the features of claim 9. Thus, the cited art does not teach or suggest all of the features of claims 12-13. Accordingly, at least for these reasons, claims 12-13 are allowable at least by virtue of their dependency from claim 9 and Applicant asks the Examiner to withdraw the rejections of these claims.

Independent Claim 14

[0024] Applicant submits that the cited portions of Rhoads '914 and the cited portions of Yoshida do not teach or suggest at least the following features of claim 14:

- “encoding multiple binary bits of the watermark into frames of at least one subject bitframe of the digital audio signal, a different one of the multiple binary bits encoded into each of the frames, the multiple binary bits encoded into the digital audio signal in multiple states”
- “encoding a binary bit of the covert message over all the frames of the subject bitframe of the digital audio signal, the binary bit of the covert message indicating a single discrete value of the covert message, wherein the binary bit of the covert message is encoded in each frame of the subject bitframe at a different frequency with respect to each frame”

[0025] With respect to claim 14, page 8 of the Action states:

“Claim 14 recites similar limitations as found in claim 1 and therefore is rejected on the same rationale as in the rejection of claim 1.”

[0026] As explained previously, the cited portions of Rhoads '914 and the cited portions of Yoshida do not teach or suggest encoding multiple binary bits of a watermark into frames of at least one subject bitframe of a digital audio signal, a different one of the multiple binary bits encoded into each of the frames, the multiple binary bits encoded into the digital audio signal in multiple states and encoding a binary bit of a covert message over all frames of the subject bitframe of the digital audio signal, the binary bit of the covert message indicating a single discrete value of the covert message, as recited in claim 14. Additionally, Applicant respectfully submits that the cited portions of Rhoads '914 and the

cited portions of Yoshida do not teach or suggest that the binary bit of the covert message is encoded in each frame of the subject bitframe at a different frequency with respect to each frame, as recited in claim 14.

[0027] Accordingly, claim 14 is allowable because the cited art does not teach or suggest each feature of independent claim 14 and Applicant asks the Examiner to withdraw the rejection of this claim.

Dependent Claim 15

[0028] Dependent claim 15 ultimately depends upon independent claim 14. As explained previously, the cited portions of Rhoads '914 and the cited portions of Yoshida do not teach or suggest all of the features of claim 14. Thus, the cited art does not teach or suggest all of the features of claim 15. Accordingly, at least for these reasons, claim 15 is allowable at least by virtue of its dependency from claim 14 and Applicant asks the Examiner to withdraw the rejection of this claim.

Independent Claim 18

[0029] Applicant submits that the cited portions of Rhoads '914 and the cited portions of Yoshida do not teach or suggest at least the following features of claim 18:

- “receiving a first data pattern of discrete values which are bits of a watermark and a second data pattern of discrete values which are bits of a covert message”
- “imposing a discrete value of the second data pattern over one or more discrete values of the first data pattern to generate a third data pattern, wherein the imposing is carried out by performing a Boolean operation with a discrete value of the second data pattern and multiple discrete values of the first data pattern”
- “encoding the third data pattern into the digital signal, wherein a different bit of the watermark is encoded in each frame of at least one subject bitframe, and wherein a same bit of the covert message is encoded in each frame of the subject bitframe”

[0030] With respect to claim 18, page 6 of the Action states:

“**Claims 8, 18, 20, and 22**, recite the same limitation as the rejected claim 1 except for incorporating the claimed method into a computer readable medium, a system, or an apparatus. **Rhoads et al** implements the invention in apparatus and system (see figures 1 and 2). Therefore, claims 8, 18, 20, 22, and 23 are rejected on the same rationale as the rejection of claim 1.”

[0031] As explained previously, the cited portions of Rhoads '914 and the cited portions of Yoshida do not teach or suggest receiving a first data pattern of discrete values which are bits of a watermark and a second data pattern of

discrete values which are bits of a covert message, imposing a discrete value of the second data pattern over one or more discrete values of the first data pattern to generate a third data pattern, and encoding the third data pattern into the digital signal, where a different bit of the watermark is encoded in each frame of at least one subject bitframe, and where a same bit of the covert message is encoded in each frame of the subject bitframe, as recited in claim 18. Additionally, as explained previously, the cited portions of Rhoads '914 and the cited portions of Yoshida do not teach or suggest imposing a discrete value of the second data pattern over one or more discrete values of the first data pattern to generate a third data pattern by performing a Boolean operation with a discrete value of the second data pattern and multiple discrete values of the first data pattern, as recited in claim 18.

[0032] Accordingly, claim 18 is allowable because the cited art does not teach or suggest each feature of independent claim 18 and Applicant asks the Examiner to withdraw the rejection of this claim.

Independent Claim 19

[0033] Applicant submits that the cited portions of Rhoads '914 and the cited portions of Yoshida do not teach or suggest at least the following features of claim 19:

- “receiving a digital signal, the digital signal being segmented into a series of bitframes which each include a set of frames, the digital

signal having an encoded data pattern of discrete values representing a first data pattern of discrete values which are bits of a watermark, a different bit of the watermark encoded in each frame of at least one subject bitframe, and a covert data pattern of discrete values which are bits of a covert message, a same bit of the covert message encoded in each frame of the subject bitframe”

[0034] With respect to claim 19, page 7 of the Action states:

“Claims 9, 13, 19, and 21 recite similar limitations as found in claim 1 and therefore is (sic) rejected on the same rationale as in the rejection of claim 1.”

[0035] As explained previously, the cited portions of Rhoads '914 and the cited portions of Yoshida do not teach or suggest receiving a digital signal that is segmented into a series of bitframes which each include a set of frames, where the digital signal has an encoded data pattern of discrete values representing a first data pattern of discrete values which are bits of a watermark with a different bit of the watermark encoded in each frame of at least one subject bitframe, and a covert message of discrete values which are bits of a covert message with a same bit of the covert message encoded in each frame of the subject bitframe, as recited in claim 19. Accordingly, claim 19 is allowable because the cited art does not teach or suggest each feature of independent claim 19 and Applicant asks the Examiner to withdraw the rejection of this claim.

Independent Claim 20

[0036] Applicant submits that the cited portions of Rhoads '914 and the cited portions of Yoshida do not teach or suggest at least the following features of claim 20:

- “receive a first data pattern of discrete values which are bits of a watermark and a second data pattern of discrete values which are bits of a covert message”
- “impose a discrete value of the second data pattern over one or more discrete values of the first data pattern to generate a third data pattern, wherein the imposition is carried out by performing a Boolean operation with a discrete value of the second data pattern and multiple discrete values of the first data pattern”
- “encode the third data pattern into the digital signal, wherein a different bit of the watermark is encoded in each frame of at least one subject bitframe, and wherein a same bit of the covert message is encoded in each frame of the subject bitframe”

[0037] With respect to claim 20, page 6 of the Action states:

“**Claims 8, 18, 20, and 22**, recite the same limitation as the rejected claim 1 except for incorporating the claimed method into a computer readable medium, a system, or an apparatus. **Rhoads et al** implements the invention in apparatus and system (see figures 1 and 2). Therefore, claims 8, 18, 20, 22, and 23 are rejected on the same rationale as the rejection of claim 1.”

[0038] As explained previously, the cited portions of Rhoads '914 and the cited portions of Yoshida do not teach or suggest receiving a first data pattern of discrete values which are bits of a watermark and a second data pattern of discrete values which are bits of a covert message, imposing a discrete value of the second data pattern over one or more discrete values of the first data pattern to generate a third data pattern, and encoding the third data pattern into a digital signal, where a different bit of the watermark is encoded in each frame of at least one subject bitframe, and where a same bit of the covert message is encoded in each frame of the subject bitframe, as recited in claim 20. Additionally, as explained previously, the cited portions of Rhoads '914 and the cited portions of Yoshida do not teach or suggest imposing a discrete value of the second data pattern over one or more discrete values of the first data pattern to generate a third data pattern by performing a Boolean operation with a discrete value of the second data pattern and multiple discrete values of the first data pattern, as recited in claim 20.

[0039] Accordingly, claim 20 is allowable because the cited art does not teach or suggest each feature of independent claim 20 and Applicant asks the Examiner to withdraw the rejection of this claim.

Independent Claim 21

[0040] Applicant submits that the cited portions of Rhoads '914 and the cited portions of Yoshida do not teach or suggest at least the following features of claim 21:

- “receive a digital signal, the signal having an a watermark encoded therein, the watermark being an encoded data pattern of discrete values is encoded into the signal in one of multiple discrete states, the encoded data pattern representing multiple data patterns comprising an original watermark data pattern and a covert data pattern”

[0041] With respect to claim 21, page 7 of the Action states:

“Claims 9, 13, 19, and 21 recite similar limitations as found in claim 1 and therefore is (sic) rejected on the same rationale as in the rejection of claim 1.”

[0042] As explained previously, the cited portions of Rhoads '914 and the cited portions of Yoshida do not teach or suggest receiving a digital signal having a watermark encoded therein, the watermark being an encoded data pattern of discrete values is encoded into the signal in one of multiple discrete states, and the encoded data pattern representing multiple data patterns comprising an original watermark data pattern and a covert data pattern, as recited in claim 21. Accordingly, claim 21 is allowable because the cited art does not teach or suggest each feature of independent claim 21 and Applicant asks the Examiner to withdraw the rejection of this claim.

Independent Claim 22

[0043] Applicant submits that the cited portions of Rhoads '914 and the cited portions of Yoshida do not teach or suggest at least the following features of claim 22:

- “a receiver for receiving a first data pattern of discrete values which are bits of a watermark and a second data pattern of discrete values which are bits of a covert message”
- “an imposer coupled to such receiver, the imposer for imposing a discrete value of the second data pattern over one or more discrete values of the first data pattern to generate a third data pattern, wherein the imposer carries out its imposing by performing a Boolean operation with a discrete value of the second data pattern and multiple discrete values of the first data pattern”
- “an encoder coupled to the receiver and the imposer, the encoder for inserting within the digital signal one or more values of the third data pattern which are results of the imposer’s imposing a discrete value of the second data pattern over one or more values of the first data pattern, wherein a different bit of the watermark is encoded in each frame of at least one subject bitframe, and wherein a same bit of the covert message is encoded in each frame of the subject bitframe”

[0044] With respect to claim 22, page 6 of the Action states:

"Claims 8, 18, 20, and 22, recite the same limitation as the rejected claim 1 except for incorporating the claimed method into a computer readable medium, a system, or an apparatus. **Rhoads et al** implements the invention in apparatus and system (see figures 1 and 2). Therefore, claims 8, 18, 20, 22, and 23 are rejected on the same rationale as the rejection of claim 1."

[0045] As explained previously, the cited portions of Rhoads '914 and the cited portions of Yoshida do not teach or suggest receiving a first data pattern of discrete values which are bits of a watermark and a second data pattern of discrete values which are bits of a covert message, imposing a discrete value of the second data pattern over one or more discrete values of the first data pattern to generate a third data pattern, and inserting within a digital signal one or more values of the third data pattern which are results of imposing a discrete value of the second data pattern over one or more values of the first data pattern, where a different bit of the watermark is encoded in each frame of at least one subject bitframe, and where a same bit of the covert message is encoded in each frame of the subject bitframe, as recited in claim 22. Additionally, as explained previously, the cited portions of Rhoads '914 and the cited portions of Yoshida do not teach or suggest imposing a discrete value of the second data pattern over one or more discrete values of the first data pattern to generate a third data pattern by performing a Boolean operation with a discrete value of the second data pattern and multiple discrete values of the first data pattern, as recited in claim 22.

[0046] Accordingly, claim 22 is allowable because the cited art does not teach or suggest each feature of independent claim 22 and Applicant asks the Examiner to withdraw the rejection of this claim.

Independent Claim 24

[0047] Applicant submits that the cited portions of Rhoads '914 and the cited portions of Yoshida do not teach or suggest at least the following features of claim 24:

- “encoding the third data pattern into the digital signal to generate the marked signal, wherein a different bit of the watermark is encoded in each frame of at least one subject bitframe, and wherein a same bit of the covert message is encoded in each frame of the subject bitframe”
- “receiving an original watermark data pattern of discrete values which are bits of a watermark and a covert data pattern of discrete values which are bits of a covert message”
- “imposing a discrete value of the covert data pattern over one or more discrete values of the original watermark data pattern to generate a third data pattern, wherein the imposing carries out its imposing by performing a Boolean operation with a discrete value of the covert data pattern and multiple discrete values of the watermark data pattern”

[0048] With respect to claim 24, page 7 of the Action states:

"As per claim 24, claim 24 recites same inventive concept as claims 1 and 9 except for replacing the second pattern by a covert channel and the first pattern by the watermarked signal. **Rhoads et al** also discloses an orientation pattern or control bits or key or detection pattern that meets the recitation of covert data pattern (column 7, line 60 through column 7, line 17). Therefore claim 24 is rejected on the same rationale as the rejection of claims 1 and 9."

[0049] As explained previously, the cited portions of Rhoads '914 and the cited portions of Yoshida do not teach or suggest receiving an original watermark data pattern of discrete values which are bits of a watermark and a covert data pattern of discrete values which are bits of a covert message, imposing a discrete value of the covert data pattern over one or more discrete values of the original watermark data pattern to generate a third data pattern, and encoding the third data pattern into the digital signal to generate a marked signal, where a different bit of the watermark is encoded in each frame of at least one subject bitframe, and where a same bit of the covert message is encoded in each frame of the subject bitframe, as recited in claim 24. Additionally, as explained previously, the cited portions of Rhoads '914 and the cited portions of Yoshida do not teach or suggest imposing a discrete value of the covert data pattern over one or more discrete values of the original watermark data pattern to generate a third pattern by performing a Boolean operation with a discrete value of the covert data pattern and multiple discrete values of the watermark data pattern, as recited in claim 24.

[0050] Accordingly, claim 24 is allowable because the cited art does not teach or suggest each feature of independent claim 24 and Applicant asks the Examiner to withdraw the rejection of this claim.

Dependent Claims 26-28

[0051] Dependent claims 26-28 ultimately depend upon independent claim 24. As explained previously, the cited portions of Rhoads '914 and the cited portions of Yoshida do not teach or suggest all of the features of claim 24. Thus, the cited art does not teach or suggest all of the features of claims 26-28. Accordingly, at least for these reasons, claims 26-28 is allowable at least by virtue of their dependency from claim 24 and Applicant asks the Examiner to withdraw the rejections of these claims.

Independent Claim 35

[0052] Applicant submits that the cited portions of Rhoads '914 and the cited portions of Yoshida do not teach or suggest at least the following features of claim 35:

- “receiving a first data pattern of discrete values which are bits of a watermark and a second data pattern of discrete values which are bits of a covert message”

- “imposing a single discrete value of the second data pattern on a plurality of values of the first data pattern, wherein the imposing encodes a third data pattern into the digital audio signal, wherein a different bit of the watermark is encoded in each frame of a plurality of bitframes of the digital audio signal, wherein a same bit of the covert message is encoded in each frame of a respective bitframe of the digital audio signal and the plurality of bitframes are arranged in a particular order”
- “permuting a respective set of values encoded in each of the plurality of bitframes such that the respective sets of values associated with the plurality of bitframes are arranged in a different order than the particular order of the plurality of bitframes”

[0053] With respect to claim 35, page 4 of the Action rejects claim 35 on the same basis as claim 1, “**As per claims 1, 7, 35-36, and 40-41, Rhoads et al** discloses...”

[0054] Therefore, as explained previously, the cited portions of Rhoads '914 and the cited portions of Yoshida do not teach or suggest receiving a first data pattern of discrete values which are bits of a watermark and a second data pattern of discrete values which are bits of a covert message and imposing a single discrete value of the second data pattern on a plurality of values of the first data pattern, where the imposing encodes a third data pattern into a digital audio signal with a different bit of the watermark encoded in each frame of a plurality of bitframes of the digital audio signal and a same bit of the covert message is encoded in each frame of a respective bitframe of the digital audio

signal, as recited in claim 35. Additionally, Applicant respectfully submits that the cited portions of Rhoads '914 and the cited portions of Yoshida do not teach or suggest permuting a respective set of values encoded in each of the plurality of bitframes such that the respective sets of values associated with the plurality of bitframes are arranged in a different order than the particular order of the plurality of bitframes, as recited in claim 35.

[0055] Accordingly, claim 35 is allowable because the cited art does not teach or suggest each feature of independent claim 35 and Applicant asks the Examiner to withdraw the rejection of this claim.

Dependent Claims 36-41

[0056] Dependent claims 36-41 ultimately depend upon independent claim 35. As explained previously, the cited portions of Rhoads '914 and the cited portions of Yoshida do not teach or suggest all of the features of claim 35. Thus, the cited art does not teach or suggest all of the features of claims 36-41. Accordingly, at least for these reasons, claims 36-41 are allowable at least by virtue of their dependency from claim 35 and Applicant asks the Examiner to withdraw the rejections of these claims.

[0057] Further, at least some of the dependent claims include features that are not taught or suggested by the cited art. For example, the cited portions of Rhoads '914 and the cited portions of Yoshida do not teach or suggest permuting the respective sets of values of the plurality of bitframes comprises permuting

values of the respective sets of values that are included in one or more particular sub-bands of frequencies within an audible spectrum, as recited in claim 39. Hence, claim 39 is allowable for these additional reasons.

Based upon Rhoads '914 and Rhoads '604

[0058] The Action rejects claims 16 and 17 under 35 U.S.C. §103(a) as being unpatentable over Rhoads '914 in view of U.S. Patent No. 5,745,604 ("Rhoads '604"). Applicant respectfully traverses the rejections of these claims and asks the Examiner to withdraw the rejections of these claims.

Independent Claim 16

[0059] Applicant submits that the cited portions of Rhoads '914 and the cited portions of Rhoads '604 do not teach or suggest at least the following features of claim 16:

- “generating multiple watermarks”
- “assigning each of the multiple watermarks to a respective discrete value, wherein each respective discrete value represents at least a portion of a corresponding covert message”
- “selecting a watermark that corresponds to an actual discrete value of at least a specific portion of the covert message”

- “without encoding any portion of the covert message itself into a digital signal, encoding the selected watermark into the digital signal”

[0060] In contrast to claim 16, the cited portions of Rhoads '914 teach an assignment map that may be used to identify one or more samples of an image that will be modified to encode a message bit. (*See* Rhoads '604, col. 9, l. 61 – col. 10, l. 28). The cited portions of Rhoads '914 do not teach or suggest generating multiple watermarks, assigning each of the multiple watermarks to a respective discrete value, where each respective discrete value represents at least a portion of a corresponding covert message, selecting a watermark that corresponds to an actual discrete value of at least a specific portion of the covert message, and without encoding any portion of the covert message itself into a digital signal, encoding the selected watermark into the digital signal, as recited in claim 16. Rather, the assignment map of Rhoads '914 does not correlate bits of a watermark to be encoded with discrete values of a covert message.

[0061] With respect to Rhoads '904 and the features of claim 16 cited above, page 9 of the Action states, “**Rhoads** discloses in analogous art generating multiple watermarks (column 11, lines 50-67 *US Patent 5,745,604*).” However, the cited portions of the Rhoads '604 do not teach or suggest generating multiple watermarks, assigning each of the multiple watermarks to a respective discrete value, where each respective discrete value represents at least a portion of a corresponding covert message, selecting a watermark that corresponds to an actual discrete value of at least a specific portion of the covert message, and without encoding any portion of the covert message itself into a

digital signal, encoding the selected watermark into the digital signal, as recited in claim 16.

[0062] Accordingly, claim 16 is allowable because the cited art does not teach or suggest each feature of independent claim 16 and Applicant asks the Examiner to withdraw the rejection of this claim.

Dependent Claim 17

[0063] Dependent claim 17 ultimately depends upon independent claim 16. As explained previously, the cited portions of Rhoads '914 and the cited portions of Rhoads '604 do not teach or suggest all of the features of claim 16. Thus, the cited art does not teach or suggest all of the features of claim 17. Accordingly, at least for these reasons, claim 17 is allowable at least by virtue of its dependency from claim 16 and Applicant asks the Examiner to withdraw the rejection of this claim.

Based upon Rhoads '914, Yoshida, and Johnson

[0064] The Action rejects claim 42 under 35 U.S.C. §103(a) as being unpatentable over Rhoads '914 in view of Yoshida and in view of "Transform Permuted Watermarking for Copyright Protection of Digital Video" by Johnson et al. ("Johnson"). Applicant respectfully traverses the rejections of this claim and asks the Examiner to withdraw the rejections of this claim.

Independent Claim 42

[0065] Applicant submits that the cited portions of Rhoads '914 and the cited portions of Yoshida do not teach or suggest at least the following features of claim 35:

- “receiving (1) a first data pattern of discrete values which are bits of a watermark that cannot be identified and manipulated, and repeated throughout the digital signal; and (2) a second data pattern of discrete values which are bits of a covert message conveying a message that is not repeated throughout the digital signal”
- “imposing a discrete value of the second data pattern over one or more discrete values of the first data pattern to generate a third data pattern, wherein the imposing is carried out by performing a Boolean operation with a discrete value of the second data pattern and multiple discrete values of the first data pattern”
- “encoding the third data pattern into the digital signal without increasing bandwidth necessary to carry the digital signal, wherein a different bit of the watermark is encoded in each frame of at least one subject bitframe, and wherein a same bit of the covert message is encoded in each frame of the subject bitframe”

[0066] As explained previously, the cited portions of Rhoads' '914 and the cited portions of Yoshida do not teach or suggest receiving (1) a first data

pattern of discrete values which are bits of a watermark that cannot be identified and manipulated and repeated throughout the signal and (2) a second data pattern of discrete values which are bits of a covert message conveying a message that is not repeated throughout the digital signal, imposing a single discrete value of the second data pattern over one or more discrete values of the first data pattern to generate a third data pattern, and encoding the third data pattern into the digital signal, where a different bit of the watermark is encoded in each frame of at least one subject bitframe, and where a same bit of the covert message is encoded in each frame of the subject bitframe, as recited in claim 42. Additionally, as explained previously, the cited portions of Rhoads '914 and the cited portions of Yoshida do not teach or suggest imposing a discrete value of the second data pattern over one or more discrete values of the first data pattern to generate a third data pattern by performing a Boolean operation with a discrete value of the second data pattern and multiple discrete values of the first data pattern, as recited in claim 42. Further, Applicant respectfully submits that the cited portions of Rhoads '914 and the cited portions of Yoshida do not teach or suggest encoding the third data pattern into the digital signal without increasing the bandwidth necessary to carry the digital signal, as recited in claim 42.

[0067] With respect to the features of claim 42 and Johnson, page 12 of the Action states:

"Rhoads et al does not explicitly disclose the first data pattern of discrete values which are bits of a watermark cannot be identified and manipulated. **Johnson et al.** in an analogous art discloses on page 684,

second column that an invisible watermark is preferable for copyright protection as visible watermarks are not suitable and do not offer a high level of security and further discloses that to provide copyright protection for a complete image sequence requires repetition of watermark data bits (see page 686, section 4)."

[0068] However, the cited portions of Johnson do not teach or suggest receiving (1) a first data pattern of discrete values which are bits of a watermark that cannot be identified and manipulated and repeated throughout the signal and (2) a second data pattern of discrete values which are bits of a covert message conveying a message that is not repeated throughout the digital signal, imposing a single discrete value of the second data pattern over one or more discrete values of the first data pattern to generate a third data pattern, and encoding the third data pattern into the digital signal, where a different bit of the watermark is encoded in each frame of at least one subject bitframe, and where a same bit of the covert message is encoded in each frame of the subject bitframe, as recited in claim 42. Additionally, the cited portions of Johnson do not teach or suggest imposing a discrete value of the second data pattern over one or more discrete values of the first data pattern to generate a third data pattern by performing a Boolean operation with a discrete value of the second data pattern and multiple discrete values of the first data pattern and encoding the third data pattern into the digital signal without increasing the bandwidth necessary to carry the digital signal, as recited in claim 42.

[0069] Accordingly, claim 42 is allowable because the cited art does not teach or suggest each feature of independent claim 42 and Applicant asks the Examiner to withdraw the rejection of this claim.

Conclusion

[0070] All pending claims are in condition for allowance. Applicant respectfully requests reconsideration and prompt issuance of the application. If any issues remain that prevent issuance of this application, the **Examiner is urged to contact me before issuing a subsequent Action.** Please call or email me at your convenience.

Respectfully Submitted,

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